

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

)	
)	
In the Matter of)	
)	
Spectrum Needs of Emergency)	WT Docket No. 05-157
Response Providers)	
)	
)	
)	

Comments of Cisco Systems, Inc.

Cisco Systems, Inc. (“Cisco”) is pleased to present comments in response to the recent Public Notice on Federal, State, and local emergency response provider’s spectrum needs.¹ Cisco is the world’s leading manufacturer of Internet Protocol (“IP”) networking equipment and IP telephony hardware and software. Since the company’s inception, Cisco’s engineers have been leaders in the development of IP networking technologies. The company’s tradition of IP innovation continues with industry-leading products in its core areas of routing and switching, as well as advanced technologies in IP telephony, other IP-enabled services, and wireless broadband equipment.

Under the Intelligence Reform and Terrorism Prevention Act of 2004 (“Intelligence Reform Act” or “Act”),² the Federal Communications Commission

¹ Public Notice, Input Required for FCC Report Mandated By the Intelligence Reform and Terrorism Prevention Act of 2004, WT Docket No. 05-157, FCC 05-80, released March 29, 2005.

² Intelligence Reform and Terrorism Prevention Act of 2004, Pub. L. 108-458, 118 Stat. 3638 (2004) (“Intelligence Reform Act”).

(“Commission”) is required to conduct a study assessing the short- and long-term spectrum needs of emergency response providers. In its Public Notice, the Commission seeks a broad range of information on which to build its report to Congress. Among other things, the Commission asked for information about the use of commercial technologies to provide public safety services, future spectrum needs, and interoperability issues.

Cisco commends both the public safety community and the Commission for their efforts in laying the foundation for improved public safety wireless communications, an effort that has not been restricted to spectrum availability. For example, the public safety community has worked diligently to standardize the air interfaces and other interfaces for public safety radio systems as part of Project 25, and both public safety and the Commission have completed a significant amount of work on new rules for the public safety service at 700 MHz.³

For its part, Cisco has also been actively developing new technology to serve the needs of the public safety community. For example, Cisco has developed mobile wireless routers used in first responder vehicles, and has crafted wireless solutions from its 802.11 product set to deliver broadband services to public safety. However, there is one Cisco technology that is particularly relevant to the interoperability questions being raised by the Public Notice— a land mobile radio gateway that allows multiple public safety radio

³ *See generally* The Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State, and Local Public Safety Agency Communication Requirements through the Year 2010, First Report and Order, WT Docket No. 96-86, 14 FCC Rcd 152 (1998).

networks using different radio frequencies and different technologies to interoperate for voice communications. Cisco provides a description of this technology, below, to demonstrate how IP-based network technology has the ability to ease what have been difficult issues of reconciling diverse frequencies and technology for the public safety community.

The Public Notice reports that more than 97 megahertz of spectrum is allocated in support of public safety communications, including 24 megahertz in the 700 MHz band, and 50 megahertz at 4940-4990 MHz for broadband applications.⁴ Although the overall amount of spectrum allocated to public safety has been growing, one of the most salient characteristics of public safety spectrum is that it is presently scattered in non-contiguous blocks. In addition, spectrum available to state and local emergency response agencies is not contiguous with spectrum available to federal first responders. As a general rule, embedded radio systems that work at one set of frequencies are not enabled to interoperate with radios tuned to another set of frequencies. To complicate the picture further, different first responder agencies operating on the same spectrum will often utilize different radio technology, which acts as a further barrier to interoperability.

Cisco's land mobile radio ("LMR") gateway solution uses a commercially available off-the-shelf router that has the capability to adapt incoming LMR audio and signaling to IP packets, and outgoing IP packets to LMR audio and signaling. Use of the LMR gateway enables voice

⁴ Public Notice at 3.

communications between users of different LMR radio networks. From the user's perspective, conversations occur as if the communication were happening on a single system.

In a simplified example, assume two first responder organizations wish to interoperate. Each has an existing radio system, but the systems use different technologies and operate on different frequencies. Each agency would install an LMR gateway that would be connected, using an IP transport link, to a single dispatch center. A user on one radio system could thereby communicate with a user on another system, in a point-to-point configuration. In addition, a user could communicate a point-to-multipoint message with users on both systems. There is no need for manual, dispatcher intervention. In addition, these networks can be linked in a short-term, ad hoc configuration, or can be permanently joined.

The benefits to public safety of an LMR gateway solution are multiple. First, as few as two first responder agencies can agree to interoperate. No region-wide or state-wide decisions are necessary. Any agencies that wish to interoperate can agree to do so and install LMR gateways. While as few as two agencies can take advantage of LMR interoperability, the solution is highly scalable and can support multiple agencies and thousands of users.

Second, embedded radio systems need not be changed in order to achieve interoperability. The cost of replacing embedded first responder systems at the federal, state, and local levels has been estimated to be nearly

\$20 billion.⁵ Achievement of interoperability by upgrading and standardizing radio equipment would come at a high societal cost. By interconnecting existing systems using an IP network that sits behind the RF network, no radios need be upgraded.

Third, while no radios need be upgraded, the LMR gateway approach ensures that as new technology is adopted, and as frequencies assigned to public radio change over time, interoperability of systems is maintained. An LMR gateway in use today for today's configuration of public safety spectrum in the 800 MHz band, for example, will continue to support interoperability tomorrow as the 800 MHz band is reconfigured.

Cisco is confident that network-centric approaches to resolving issues such as radio system interoperability are an efficient and robust mechanism to resolve RF interoperability issues. Use of devices such as the LMR gateway does require the relevant agencies to utilize IP in that portion of the network that connects radio transmission facilities to dispatch and/or command and control centers. As a result, not all first responder agencies can immediately move to take advantage of this IP-based technology. However, as governmental jurisdictions continue to upgrade their networks to take advantage of the many benefits that IP delivers, solutions such as the LMR gateway will be readily available to an increasing number of first

⁵ Public Safety Wireless Network LMR Replacement Cost Study Report, http://www.safecomprogram.gov/NR/rdonlyres/B69361FA-9AC6-4126-B971-83DF30FED932/0/lmr_coststudy.pdf

responder agencies. In fact, as governments upgrade their networks, IP communications is becoming the dominant architecture of choice. A network-centric interoperability solution may well prove to be a practical, cost-effective interoperability solution for the majority of first responders.

Respectfully submitted,

CISCO SYSTEMS, INC.

Mary L. Brown
Senior Telecommunications Policy
Counsel
1300 Pennsylvania Avenue, NW Suite
250
Washington, DC 20004
(202) 354-2923

April 28, 2005